ZF Commercial Suspension Systems & Components LLC

South Carolina Manufacturing Extension Partnership

ZF Commercial Suspension Systems 'Goes Lean' with Assistance from SCMEP

Client Profile:
ZF Commercial Suspension Systems & Components LLC, (ZF) a subsidiary of the ZF Group North American Operations, produces chassis and steering components for commercial vehicles such as IFS steer axles, torque rods, drag links, tie rods and suspension ball joints. ZF's primary customers include Freightliner, Mack, Volvo, ArvinMeritor and Dana. The plant in Lancaster, South Carolina employs 100 people.

Situation:
ZF Commercial Suspension Systems had been a long-term client of the South Carolina Manufacturing Extension Partnership (SCMEP), a NIST MEP network affiliate, receiving training in problem solving and basic Lean principles. Once again, the company approached SCMEP Manufacturing Specialist Rhonda Huskins for assistance with the implementation of Lean.

Solution:
SCMEP's Lean Specialist, Alen Hartsoe, reviewed ZF's immediate and long-term needs and identified an improvement team to do the implementation. SCMEP established a baseline and measurable improvement goals to increase throughput by focusing on where the basic forms of waste or non-value-added activity was taking place. One of the first projects ZF selected involved the hot crimp press process that feeds the commercial suspension systems. The average production rate for the hot crimp press was 2.76 parts per minutes. The average changeover time was almost 40 minutes. The management team established two goals: 1) reduce the average parts per minute by a minimum of 25 percent, or 2.07 minutes per part; and 2) reduce changeover time by a minimum of 60 percent. An analysis revealed several in-process wastes that could be addressed, including excess processing, waiting on materials, and defects requiring rework.
The hot crimp press process involved a considerable amount of non-value-added walking and motion due to the layout of the work area. After reconfiguring the layout to reduce travel, the 'minutes per part' metric improved by 37 percent. Realignment of supplied parts was often required during the hot crimp press process. The team determined that changes, such as fabricating alignment jigs for the straddle balls, could be made. This allowed proper alignment during the upstream assembly and eliminated the need to realign at the hot crimp press. Waiting time was reduced by creating a material scheduling board for the material handlers. Two additional Lean tools, Single Minute Exchange of Die (SMED), and 5S were applied to the changeover process. Time wasted searching for tooling in drawers during changeover represented an additional improvement opportunity. 5S techniques were applied to relocate tooling from drawers to pegboards, thus creating a more organized, standardized and visual work area. Setup sheets were developed for each hot crimp part, and a measuring system was added to each fixture. As a result, the operator can transfer the settings from the setup sheet to the fixture, thus eliminating adjustments (set, test, reset and re-test) during changeover. This procedural modification resulted in a reduction in changeover time nearly 40 minutes to a little over 5 minutes, an

improvement of 86 percent.

Results:
* Realized cost savings of $1 million.
* Improved parts-per-minutes by 37 percent.
* Reduced changeover time by 86 percent.

Testimonial:
"SCMEP has been an integral part of our successful implementation of Lean in our organization. Their leadership and skills were invaluable in this project. We have significantly increased output and improved quality thanks to our implementing the Lean process in our plant. Through these results, we were able to redirect $1 million in approved capital funds to other needed areas of our plant."
Greg Henderson, General Manager